Lesson 5

Management of the Surveillance System and Quality Control of Data

Instructor's Guide Form

Lesson Title: Management of the surveillance system and quality control of data

Lesson Goal: For each student to be able to describe the management and quality control of a disease-reporting system for notifiable diseases

Lesson Objectives: By the end of this lesson, the learner will be able to:

1) describe the types of disease reports used in surveillance systems

2) differentiate between the classifications of surveillance systems

3) describe how data are collected and entered into a surveillance system

4) describe documentation and training issues in managing a surveillance system

5) describe the assessment of reports

6) explain data sharing

7) describe the role of the data base manager

8) list the steps in effective maintenance programs

9) describe ways to maintain integrity and confidentiality

10) describe the steps in the modification of reporting systems

Time required: 70 minutes

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Management of the Surveillance System and Quality Control of Data

Instructor's Guide Form (continued)

Equipment and materials needed:

- Overhead projector
- Transparencies #5.1 - #5.20

Synopsis of lesson: This lesson provides a description of the practical management and quality control at the report-gathering stage of a disease-reporting system for notifiable diseases.

Adult Education Application: The content of this chapter outlines a number of questions to be asked by the management level of the public health organization regarding the collection, analysis, reporting, and maintenance of a surveillance system. Each of these questions could be posed to the learners to prompt an interactive discussion. The purpose of the discussion would be to engage the learners in the application of this information to their own environment. You could facilitate a particularly interesting discussion around the issues associated with system security and confidentiality.

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Management of the Surveillance System and Quality Control of Data

Topical Outline

I. Types of reports and surveillance systems
- A. Categories of notifiable-disease reports
- B. Classifications of surveillance systems

II. Collection of data
- A. Reporting scheme
- B. Entry of data into the surveillance system
- C. Documentation and training

III. Analysis and standard reports
- A. Areas to be covered in reporting process
- B. Assessments of reports

IV. Data sharing
- A. Sharing of data by local or state health departments
- B. Role of Data Base Manager (DBM)

V. System maintenance and security
- A. Steps in an effective maintenance program
- B. Methods of maintaining integrity
- C. Risks to security data base
- D. Confidentiality

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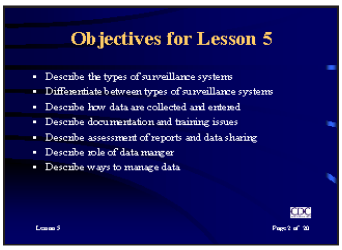
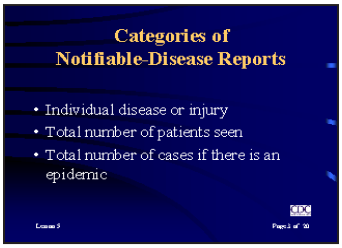
Management of the Surveillance System and Quality Control of Data

Topical Outline (continued)

VI. Modification of reporting systems

A. Review current methods of processing disease and injury information
B. Review problems with management and users
C. Document
D. Seek review and comment from concerned parties
E. Address access issues
F. Develop prototypes
G. Establish self-contained modules of development
H. Begin development in a test environment
I. Produce processing manuals
J. Develop training programs
K. Finalize specification documents
L Establish and document proper back-up and data-recovery techniques





Lesson 5

Management of the Surveillance System and Quality Control Data

Content Outline

Lesson Objectives

- **Describe types of surveillance systems**
- **Differentiate between types of surveillance systems**
- **Describe how data are collected and entered**
- **Describe documentation and training issues**
- **Describe assessment of reports and data sharing**
- **Describe role of data manager**
- **Describe ways to manage data**

I. Types of Disease Reports and Surveillance Systems

A. Categories of notifiable-disease reports

1. reports in which information is collected on each individual with the disease or injury

2. reports of conditions for which only the total number of patients seen is reported

3. reports of conditions for which the total number of cases is reported if, and only if it is judged to be an epidemic

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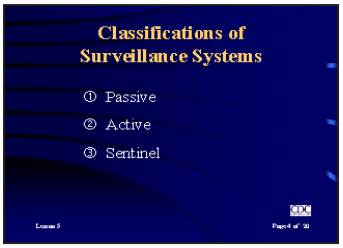

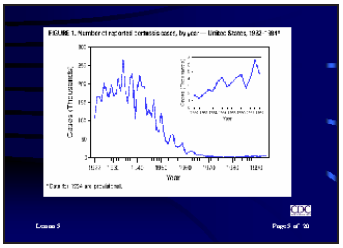

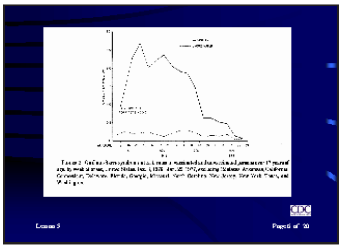

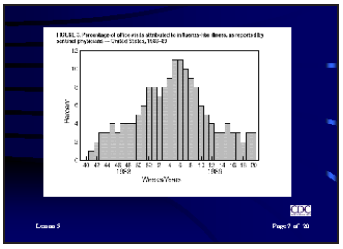

B. Classifications of surveillance systems

1. passive surveillance system
    a. one in which the health jurisdiction receives disease or injury reports from health care providers as mandated by state law
    b. less costly to operate than active systems
    c. most states have comprehensive passive infectious disease surveillance systems
    d. the most common method used for reporting
    e. example-Pertussis, 1995
2. active surveillance system
    a. one in which the health department regularly contacts reporting sources to elicit reports
    b. provides more complete reporting
    c. more labor intensive
    d. more costly to operate
    e. example- Guillan-Barre, 1976

3. sentinel surveillance system may be passive or active (example-Influenza

II. Collection of data

A. Reporting scheme

1. state and local laws specify who is responsible for reporting and to whom reports should be directed

2. data are analyzed, summarized, and used locally on a regular basis

3. information is forwarded to the state health department to be consolidated with reports from other local health departments

4. composite data are examined for trends

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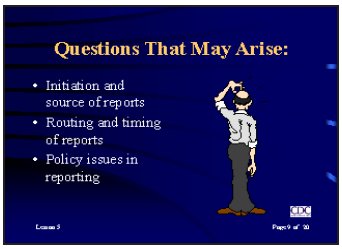

5. state health department then voluntarily reports reportable cases to CDC on a weekly basis

6. system should document how to respond to questions which may arise
    a. questions related to initiation and sources of reports
        1) how does one notify health-care professionals (existing and newly practicing) about the requirements and procedures for reporting to the health department?
        2) by what agency are conditions reported for such temporary residents as college students, military personnel, and migrant workers?
    b. questions related to routing and timing of reports
        1) how should "suspected case, laboratory results pending" be handled?
        2) how should the local or the state health department update a case report when additional information is received
        3) should a diagnostic laboratory send data on reportable conditions to the requester, or should it also be responsible for reporting to appropriate local and state health departments?
        4) if a case occurs during one calender year, but is not reported until early in the next calendar year, what is the year of report?
        5) what is the cutoff date for reports

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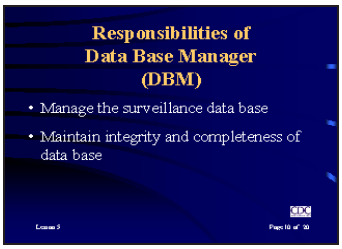
from the previous year?

6) as appropriate, is there a mechanism for reporting disease and injury across state lines?

c. questions related to policy issues in reporting disease and injury

1) what items on the reporting form must be completed before a report can be forwarded?
2) if a reportable condition has a specific case definition (such as measles and AIDS), should the case be reported before confirmation by a disease investigator?
3) what mechanism will be (has been) established to deal with situations in which cases must be reported in batches rather than individually because the number of reports is overwhelmingly large?
4) if case reports are held pending laboratory confirmation, should the "date of report" reflect the original date of report, the date laboratory confirmation was received, or some other date associated with this health event?
5) are reports generated to identify records with incomplete or unconfirmed data so that follow-up can be initiated?
6) how are discrepancies in the information on duplicate reports resolved?



B. Entry of data into the surveillance system

1. data base manager (DBM) is responsible for management of surveillance data base

2. DBM should maintain the integrity and completeness of the data base

3. checklist for DBM
    a. who will enter the data?
    b. what are the qualifications of data entry personnel?
    c. who serves as back-up for data entry personnel?
    d. who will update and back-up computer records?
    e. when will data be entered?
    f. does the data-entry screen replicate hard copy?
    g. does the data-entry program allow for data items to be entered automatically on subsequent screens, if necessary?
    h. does the data-entry program effectively validate the data being entered for completeness by use of "must-enter" fields and "look-up" files?
    i. does data-entry program have ability to do range checking on values entered? What are acceptable ranges?
    j. is there an audit procedure in the system to look for incorrectly coded information?
    k. at what level (state or local) will records be changed or deleted?
    l. who owns the data records?
    m. if the data base is distributed to other users as an electronic file or on floppy diskette, are there safeguards to prevent overwriting another user's data?

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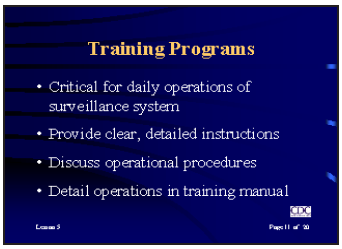
n. are there safeguards against computer viruses?
o. are the data-entry programs flexible enough to allow variables to be modified as prescribed by changes in state regulations and national recommendations?
p. are production reports automatically generated for quality assurance of data entry?
q. how and with what frequency are data copied and stored for back-up purposes?
r. are paper and film copies maintained (in the event of computer failure)?
s. are double-entry systems used for quality assurance?

C. Documentation and training



1. crucial step in the development of a computerized system

2. user's manual should provide clear descriptions
    a. general description of the entire system
    b. detailed procedures for installing the system
    c. detailed procedures for operating the system
    d. detailed procedures for maintaining the system

3. training program
    a. for persons involved in the daily operation of the surveillance system
    b. staff members must feel that they can participate in shaping the system
    c. training
        1) provide hands-on experience with database software
        2) discuss operational procedures
        3) software tutorial packages and videotapes can be useful

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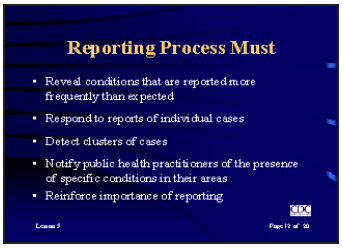

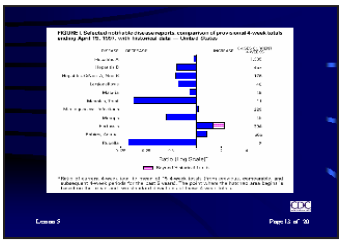

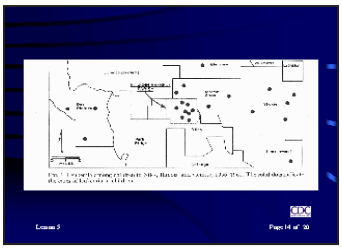

III. Analysis and standard reports

A. Areas to be covered in reporting process

1. reveal a condition that is being reported more or less frequently than expected

2. the appropriate response follows reports of individual cases

3. clusters of cases or abnormal behaviors are detected (example- Cancer cluster

4. public health practitioners are notified of the presence of specific conditions in their areas

5. reinforce the importance of reporting through facilitating effective control and prevention activities

B. Assessments of reports

1. completeness and timeliness should be assessed regularly

2. assessment items
    a. proportion of the reports with each variable such as
        1) age of patient
        2) date of onset
        3) date completed
        4) time interval to report

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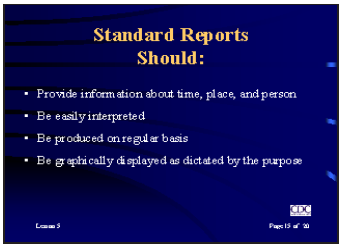
b. the assessment should identify groups or institutions in need of additional information or training on disease reporting

3. feedback to contributors to data base
    a. important to demonstrate to those involved with the system that data are being used
    b. important to accomplish communications goals
    c. can be done through surveillance reports that can include standard tabular reports of the occurrence of a reportable condition by week or month, with a year- to-date summary and narrative material
    d. should include, as appropriate, analyses of data, including comparison to previous year(s) data



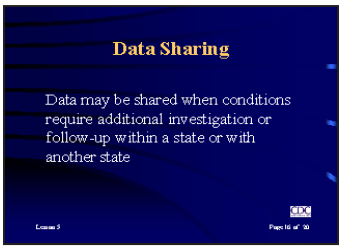
4. standard reports
    a. should include data for management needs of management and operations personnel
    b. should include information on time, place, and person
    c. should be produced on a regular basis

    d. should be produced in a form that can be easily interpreted by epidemiologists and management personnel

    e. purpose should dictate the appearance of the output (table, map, graph)

IV. Data sharing

A. Sharing of data by local and state health departments



1. shared particularly when conditions require additional investigation or follow-up either within a state or with another state

2. health authorities need to be able to track condition to its source in order to respond appropriately

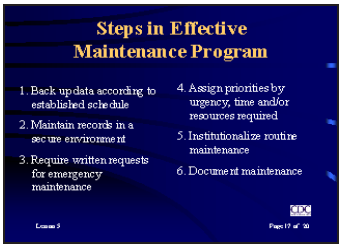
B. Role of Data Base Manager (DBM)

1. should be aware of other sources of information that may need to be accessed and compared with or added to the data collected in his own system
    a. laboratory results
    b. epidemiologic information for specific conditions
    c. population estimates
    d. mortality records

2. should encourage adoption of standard coding schemes to facilitate sharing and use of data

V. System maintenance and security

A. Steps in an effective maintenance program



1. back up data and system files according to an established schedule

2. maintain records in a secure environment

3. require that requests for emergency maintenance be made in writing and entered into a log

4. assign priorities to special requests on the basis of urgency of need and time and resources required

5. institutionalize routine maintainence, such as procedures associated with changing to a new reporting year

6. document maintainence as it is conducted

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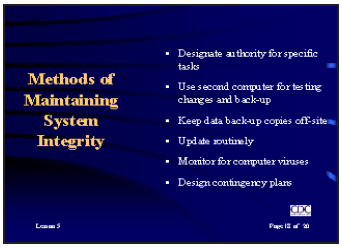

B. Methods of maintaining integrity

1. only one person should have the authority to access the system and to assign passwords; however, another person should be appointed as an authorized back up in the case of illness, etc.

2. DBM should be only staff with authority to install or modify production software

3. DBM should be only staff with access to physical computer files

4. only one person should have authority to add or delete files (with an appointed person as back up)

5. second computer should be available for testing changes to the system

6. second computer should be used as a back-up computer should the primary machine fail

7. back-up copies of data base should be kept off-site to ensure the system cannot be deliberately or unintentionally destroyed

8. updating of off-site copies should be done on a routine basis
9. new diskettes should be used to make back-up copies at least annually

10. a monthly, total system back-up is recommended

11. data files changed during the day should be backed up at the end of the day

12. computer viruses should be monitored

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a. viruses are highly sophisticated programs which can attach themselves to software through data being loaded on the computer or data being sent from one computer to another
b. use software to scan entire systems of diskettes for virus infections
c. data received via telecommunications channels or on diskettes from other sources should be scanned before being copied to computer's hard drive

13. contingency plan should be in place for shifting the base of operations to another computer

C. Risks to security of data base

1. mechanical failure

2. human carelessness

3. malicious damage

4. crime

5. invasion of privacy

6. risks increased with development of the internet

D. Confidentiality

1. confidentiality must be maintained

2. do not receive or remove personal identifiers if not necessary for control and prevention measures

VI. Modification of reporting systems

A. Review current methods of processing disease and injury information

1. obtain copies of paper forms, computer screen forms, or reports

2. determine whether suggested report forms or screens are available from state or national agencies

3. consider ready-to-use surveillance software to facilitate standardization, quality control, and comparability of data, for example, Epi Info

B. Review problems with management and users

1. present method

2. future enhancements

C. Document

1. current and proposed systems

2. development specifications

3. proposed testing schedules

4. methodology for implementing the system when it is completed

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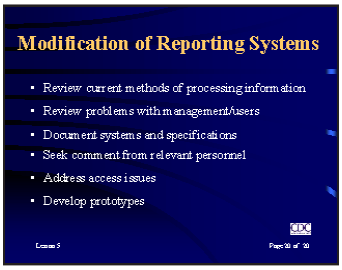

D. Seek review and comments from concerned parties

E. Address access issues

1. limit to confidential portion of a disease or injury report as much as possible
2. secure original report forms in locked room or cabinet
3. secure electronic data based by limiting access to the computer
4. obtain additional security through required use of passwords

F. Develop prototypes

1. for screens
2. for reports
3. will help to identify and resolve problems during development

G. Establish self-contained modules of development

H. Begin development in a test environment separate from any current computer-based production system

I. Produce processing manuals

J. Develop training

K. Finalize specification documents

L. Establish and document proper back-up and data recovery techniques

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